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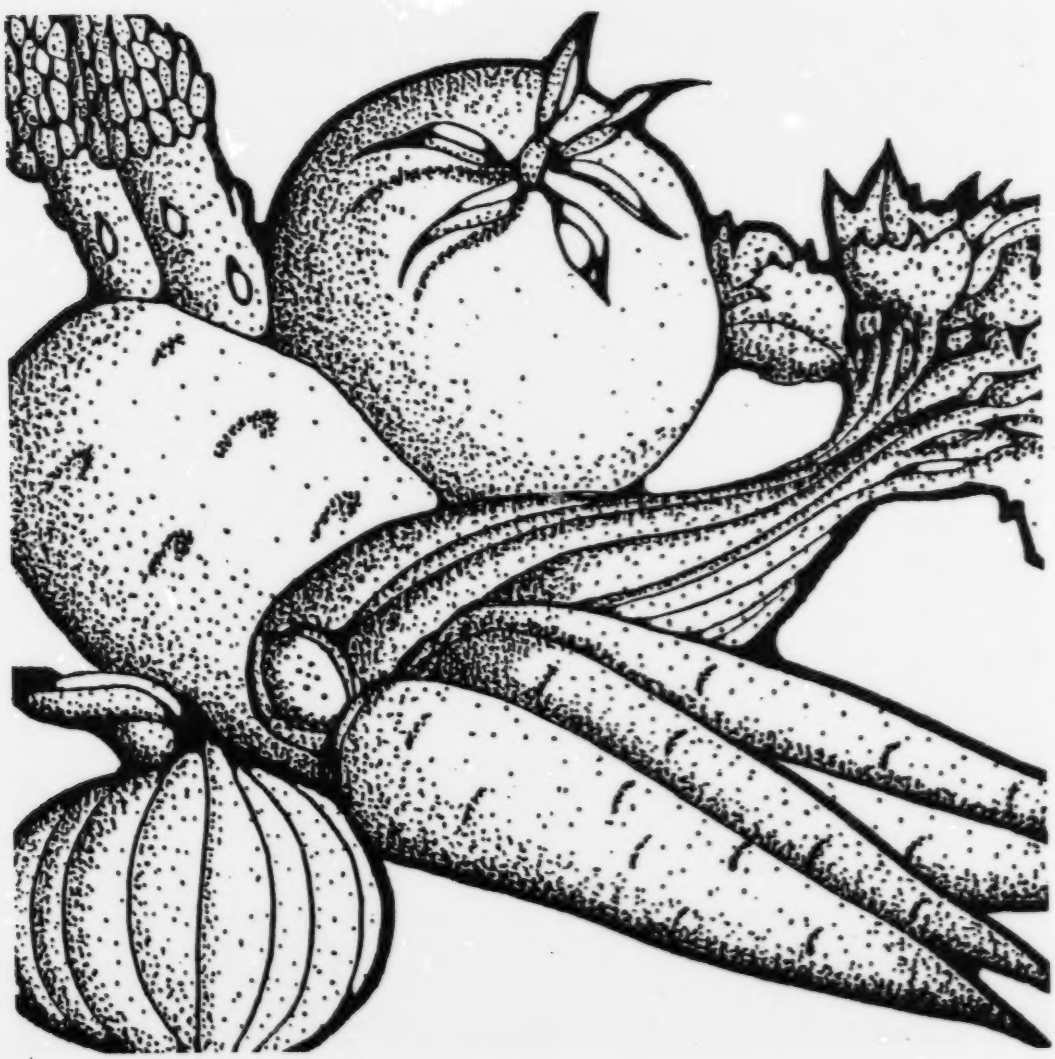
VEGETABLE CROPS: ESTIMATED PRODUCTION COSTS ONTARIO, 1988



ECONOMICS AND POLICY
COORDINATION BRANCH

ONTARIO MINISTRY OF AGRICULTURE AND FOOD
LEGISLATIVE BUILDINGS, TORONTO, ONTARIO, M7A 1B6

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ECONOMICS INFORMATION

REPORT NO. 88-08

VEGETABLE CROPS:

ESTIMATED PRODUCTION COSTS

ONTARIO, 1988

By

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INTRODUCTION

Since 1948, the Economics and Policy Coordination Branch has carried out comprehensive studies of major field and horticultural crops grown in Ontario. These studies were designed to determine costs and returns of various farm enterprises, as well as the physical amounts of production inputs required.

Traditionally, data was collected by means of farmer interviews. Published reports of these studies in the form of county, regional and provincial averages found a wide distribution among extension and research personnel, educational institutions, farm organizations, lending institutions and policy makers. Cooperating farmers received reports showing their individual information in comparison with group averages.

With this extensive background in the development of cost studies, the Economics and Policy Coordination Branch has begun to use computers in the preparation of cost data. Methods of computer simulation have now replaced the time consuming process of data collection, tabulation and analysis.

With this new approach, special attention is paid to the physical quantities and prices of inputs for each crop studied. The technology used in the production of various crops is carefully examined so that the computer models accurately reflect the appropriate production technology for each commodity.

Information on physical inputs is obtained from a number of sources, including:

1. Previous studies done by this Branch;
2. Surveys of the farm supply trade;
3. Technical input/output coefficients; and
4. The consensus of producers, researchers, and extension and agribusiness personnel.

THE DEVELOPMENT OF THE ACRES PROGRAM

A large number of computer programs that generate budgets and crop production cost estimates are now in existence. These computer programs vary in their degree of sophistication and in the amount of detail prepared. A large number of estimates covering a wide range of conditions can be generated quickly and efficiently. The effect of varying levels of technology, management practices and price levels can also be analyzed.

Cost of production estimates used in this report are based on the ACRES program. ACRES (Agricultural Crop Enterprises System) is a FORTRAN program originally written in Montana, adapted by Alberta Agriculture and recently modified and rewritten by the Economics and Policy Coordination Branch to meet Ontario conditions. All 1988 cost of production estimates in this report are based on this computer model.

METHODS AND PROCEDURES

The information used in the preparation of each production cost estimate in this report was prepared through the use of recent Economics and Policy Coordination Branch studies, plus consultations with producers and extension, research and agribusiness personnel.

For each crop cost estimate in this report, the data was organized into variable and fixed costs and totalled to arrive at the cost of production both on a per acre and per hectare basis. Variable costs are those which vary directly with the production of each crop grown. They include seed, plants, hired labour, fertilizer, herbicides, insecticides, fungicides, other materials, machinery operating costs, marketing charges and interest on operating capital. Fixed costs inputs are operator labour, management allowance, interest on land, machinery and buildings, depreciation on machinery and buildings, taxes on real estate (net of farm tax rebate), and other overhead cost items.

In this report, cash costs of production are also determined. Cash costs include total variable costs, interest on the debt portion of investment in tractors and machines, and other overhead costs.

LABOUR HOURS AND COSTS

The required number of labour hours was based on previous studies, as well as through discussions with those familiar with the production of each study crop. There are some crops which are harvested on a fixed rate per unit. For these crops, the labour hours and costs vary with the yields used in the cost estimate.

The operator labour hours were valued at $7.40 per hour. In addition, an allowance to management was made at the rate of 5 percent of the gross income.

The hired labour cost was calculated on a per hour basis and included benefits such as worker compensation, unemployment insurance and the Canada Pension Plan. The rates varied according to area, crop and skill involved.

For some crops, piece work rates were used which were suggested by local farm labour pools. An allowance of 15 percent of basic earnings was added to cover benefits.

MATERIALS

The amount of each material input was based on commonly used practices. Input prices are based on averages charged by the trade in the area where the particular crop is grown. For most crops, the quantities of seed, plants, fertilizer nutrients and other inputs are given on a per hectare basis. Because of the multitude of products available, pesticides are grouped as herbicides, insecticides, fungicides, nematicides, etc. The cost and quantity of non-returnable containers is reported where applicable.

TRACTORS, MACHINES AND TRUCKS

Machinery complements used in the various crop production cost estimates were assumed to be five years old. Tractor and machine costs included depreciation, interest on investment, insurance, storage, repairs, maintenance, fuel and lubrication. If machines were used for other farming operations, costs were adjusted based on the proportion of use on the study crop. The declining balance method of depreciation was used, and a 15 percent rate to powered and a 10 percent to non-powered machines was applied.

Interest on machinery investment was calculated on the assumption that the equity portion was 70 percent and the debt portion was 30 percent of the total depreciated value. For this report, interest on equity was calculated at 5.0 percent, which was the average interest rate paid by chartered banks on savings accounts. The interest on the debt portion was based on the average prime rate of 10.2 percent, plus one for a total of 11.2 percent. Insurance and storage costs for machinery were based on 1.5 percent of their purchase price.

Repair and maintenance costs for individual machines were based on the fact sheet, "Cost of Owning and Operating Farm Machines", Agdex 825, Ontario Ministry of Agriculture and Food.

Fuel costs were based on the size of each tractor, truck or self-propelled machine used in the production operation. The following farmgate fuel prices were used: gasoline - 29.0 cents/litre; diesel - 30.0 cents/litre. The cost of oil, grease and filters was calculated at 15 percent of the fuel cost.

CUSTOM FARMWORK SERVICES

There are crops produced in Ontario where it is an accepted practice to use custom farmwork services to perform certain operations. Usually these services are employed when the farmer needs specialized machines, such as harvesters, sprayers, fertilizer applicators and trucks. Most of these machines cannot be economically owned and operated by one producer. Custom costs were itemized on a per hectare or per acre basis.

LAND CHARGES

Determining the annual cost for land use is a controversial part in any study on production costs. During the past two decades, purchasers of farmland have been willing to pay more for it than can be justified from agricultural production. Purchasers believe the speculative aspect of land ownership in inflationary times offers benefits above those received from crop production. In deflationary times, however, this situation is reversed. For this reason, the appropriate interest rate used in calculating the interest cost on bare land for these crop production estimates is the real interest rate. The "real interest rate" is defined as the current leading rate of interest adjusted for inflation.

In this report, interest on land investment was calculated as follows:

1. The value of bare land was based on the average value for land in areas of Ontario where the production of each study crop predominates.

2. The interest rate applied was the average prime rate for 1987 of 9.5 percent discounted for the rate of inflation of 4.4 percent, which resulted in a 5.1 percent rate. It was assumed that land for all study crops would be purchased in the previous year prior to cropping.

No farm real estate taxes were charged to any study crop because of the 1988 Ontario Farm Tax Reduction Program.

BUILDING COSTS

For those crops where buildings are used in grading, packing, and/or storage, a building cost allowance was made.

The initial cost of these structures was based on the assumption that buildings were five years old.

Depreciation	%
Steel and concrete structures	2.5
Wood structures	5.0
Greenhouses	2.0

The interest on building investment was set at 5.1 percent, which was also used in calculating interest on land investment.

Repairs and Maintenance	%
Steel structures	1.0
Concrete structures	0.25
Wood structures	1.5

Insurance

0.5 percent of initial costs

The cost of machine housing was covered under tractor and machine costs.

Allowances are made for the use of picking baskets, storage bins, and other pieces of reusable equipment required in the production of certain crops.

INTEREST ON OPERATING CAPITAL

Interest on operating capital required to finance each crop was calculated from the time an expenditure was made until the time income was generated from sales. Operating capital includes the cost of materials, fuel, repairs, hired labour and other cash items. In this study, the interest rate applied to operating capital was the average estimated prime rate for 1988 of 10.2 percent plus 1 percent for a rate of 11.2 percent.

OTHER OVERHEAD

This allowance covers such items as the study crop's share of utilities, accounting and administration costs, use of the farm automobile, and general farm maintenance.

OTHER COST CONSIDERATIONS

Depending on the crop studied, there are certain additional costs such as crop insurance, marketing board fees, grading charges and selling commissions.

YIELDS AND RETURNS

For each study crop presented in this report, a footnote to the table defines how the average yield and average price were calculated.

Additional information on average yields and prices is shown in the Appendix of this report.

GROSS MARGIN ANALYSIS

Gross margin is the amount above the variable costs that a crop contributes to the operator for his wages, management, and to the investment in machinery and land.

CASH ANALYSIS

The cash analysis section estimates the returns over cash costs. Cash costs comprise of all variable costs, as well as interest on the debt portion of tractor and machine investment, real estate taxes and other overhead costs.

Table 1.--Asparagus "Preplant Year" Costs:
Estimated Cost of Production, Ontario, 1988

	Cost per hectare	Cost per acre
	- dollars -	
VARIABLE COSTS		
Fertilizer:		
10-20-30 400 kg/ha	119	48
Herbicides	126	51
Green manure seed	12	5
Tractor and machine costs:		
Repairs and maintenance	20	8
Fuel	22	9
Interest on operating capital	84	34
TOTAL VARIABLE COSTS	383	155
FIXED COSTS		
Operator labour, 7.4 hours/ha	54	22
Tractor and machine costs:		
Depreciation	54	22
Interest on investment	25	10
Insurance and storage	10	4
Interest on land, $4,450/ha @ 5.1% per annum	114	46
TOTAL FIXED COSTS	257	104
TOTAL "PREPLANT YEAR" COSTS	640	259

Table 2.--Asparagus "Preplant Year" Costs: Operation Costs, Ontario, 1988

Operation	Times over	Labour per ha	Labour per ac.	Labour, tractor and machine costs per ha	Labour, tractor and machine costs per ac.
		- hours -		- dollars -	
Plowing	1	2.47	1.0	65.43	26.48
Discing	1	1.24	.5	28.44	11.51
Seeding green manure	1	1.24	.5	31.11	12.59
Spraying herbicide	1	1.24	.5	31.01	12.55
Fertilizing	1	1.24	.5	31.11	12.59

Table 3.--Asparagus "Planting Year" Costs:
Estimated Cost of Production, Ontario, 1988

	Cost	
	per hectare	per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 74.1 hours/ha	408	165
Fertilizer:		
Superphosphate 370 kg/ha	116	47
Am. Nit. 250 kg/ha	57	23
Lime, 34.6 t/ha	69	28
Insecticides	69	28
Herbicides	188	76
Roots, 27,182/ha	2,718	1,100
Custom and rentals	153	62
Tractor and machine costs:		
Repairs and maintenance	86	35
Fuel	89	36
Interest on operating capital	665	269
TOTAL VARIABLE COSTS	4,618	1,869
FIXED COSTS		
Operator labour, 24.7 hours/ha	183	74
Tractor and machine costs:		
Depreciation	190	77
Interest on investment	84	34
Insurance and storage	37	15
Interest on land, $4,450/ha @ 5.1% per annum	227	92
Other overhead	247	100
TOTAL FIXED COSTS	968	392
TOTAL "PLANTING YEAR" COSTS	5,586	2,261

Table 4.--Asparagus "Planting Year" Costs: Operation Costs, Ontario, 1988

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha	per ac.	per ha	per ac.
		- hours -		- dollars -	
Plowing	1	2.47	1.0	65.43	26.48
Discing	2	2.47	1.0	56.98	23.06
Trenching	1	2.47	1.0	91.46	37.01
Fertilizing	1	1.24	.5	28.32	11.46
Planting	1	47.0	19.0	410.65	166.18
Replanting	1	2.47	1.0	13.59	5.50
Covering trench	1	2.47	1.0	64.05	25.92
Cultivating	2	2.47	1.0	68.75	27.82
Spraying herbicide	2	2.47	1.0	62.05	25.11
Hand hoeing	1	29.7	12.0	163.09	66.00
Fertilizing	1	1.24	.5	28.32	11.46
Spraying insecticide	2	2.47	1.0	99.24	40.16

Table 5.--Asparagus "Growth Year" Costs:
Estimated Cost of Production, Ontario, 1988

	Cost	
	per hectare	per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 12.4 hours/ha	69	28
Fertilizer:		
15-15-15 370 kg/ha	84	34
Am. Nit. 220 kg/ha	49	20
Insecticides	104	42
Fungicides	82	33
Herbicides	203	82
Tractor and machine costs:		
Repairs and maintenance	52	21
Fuel	30	12
Interest on operating capital	37	15
TOTAL VARIABLE COSTS	710	287
FIXED COSTS		
Operator labour, 9.3 hours/ha	69	28
Tractor and machine costs:		
Depreciation	84	34
Interest on investment	40	16
Insurance and storage	17	7
Interest on land, $4,450/ha @ 5.1% per annum	227	92
Other overhead	247	100
TOTAL FIXED COSTS	684	277
TOTAL "GROWTH YEAR" COSTS	1,394	564

Table 6.--Asparagus "Growth Year" Costs: Operation Costs, Ontario, 1988

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha	per ac.	per ha	per ac.
		- hours -		- dollars -	
Stalk shredding	1	.62	.25	20.86	8.44
Fertilizing	2	2.47	1.0	56.69	22.94
Cultivating	1	1.24	.5	34.35	13.90
Spraying herbicide	1	1.24	.5	31.01	12.55
Spraying pesticides	3	3.71	1.5	148.88	60.25
Hand hoeing	1	12.36	5.0	67.96	27.50

Table 7.--Asparagus Preharvest and Harvest Costs for Processing Purposes: Estimated Cost of Production, Ontario, 1988

	Cost per hectare	Cost per acre
	- dollars -	
VARIABLE COSTS		
Hired labour:		
Preharvest, 12.4 hours/ha	69	28
Harvest, 267 hours/ha	1,468	594
Fertilizer:		
15-15-15, 370 kg/ha	84	34
Am. Nit. 220 kg/ha	49	20
Insecticides	104	42
Fungicides	82	33
Herbicides	203	82
Tractor and machine costs:		
Repairs and maintenance	114	46
Fuel	200	81
Building, repairs	17	7
Marketing board & administration fee	109	44
Receiving station fees	111	45
Interest on operating capital	72	29
TOTAL VARIABLE COSTS	2,682	1,085
FIXED COSTS		
Operator labour:		
Preharvest, 9.3 hours/ha	69	28
Harvest, 32.1 hours/ha	237	96
Management allowance, 5% of gross income	198	80
Tractor and machine costs:		
Depreciation	292	118
Interest on investment	131	53
Insurance and storage	79	32
Interest on land, $4,450/ha @ 5.1% per annum	227	92
Building use	180	73
Other overhead	247	100
TOTAL FIXED COSTS	1,660	672
TOTAL PREHARVEST AND HARVEST COSTS	4,342	1,757
GROSS MARGIN ANALYSIS		
(Based on assumed yields of 2,018 kg/ha or 1,800 lbs./acre and assumed price of $1.96/kg or $0.89/lb.)		
Gross income	3,959	1,602
Variable costs:		
Amortized establishment costs[a]	739	299
Preharvest and harvest	2,682	1,085
TOTAL	3,421	1,384
Gross margin	538	218
CASH ANALYSIS		
Gross income	3,959	1,602
Cash costs:		
Amortized establishment costs[a]	739	299
Preharvest and harvest[b]	3,001	1,215
TOTAL	3,740	1,514
Returns over cash costs	219	88

[a] Amortized establishment costs include preplant and planting year costs, and growth year costs amortized over 15 years at a rate of 5.1%.

[b] Cash costs for preharvest and harvest include total variable costs plus interest on the debt portion of investment in tractors and machines of $64/ha ($26/ac.), truck insurance and other overhead costs.

Table 8.--Asparagus Preharvest and Harvest Costs for Processing Purposes: Operation Costs, Ontario, 1988

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha	per ac.	per ha	per ac.
		- hours -		- dollars -	
Stalk shredding	1	.62	.25	20.86	8.44
Fertilizing	2	2.47	1.0	56.69	22.94
Cultivating	1	1.24	.5	34.35	13.90
Spraying herbicide	1	1.24	.5	31.01	12.55
Spraying pesticides	3	3.71	1.5	148.88	60.25
Hand hoeing	1	12.36	5.0	67.96	27.50
Harvesting	[a]	212.51	86.0	1,583.09	640.64
Grading and trimming	[a]	74.13	30.0	425.52	172.20
Delivery	[a]	12.36	5.0	288.38	116.70

[a] Operation performed as required.

Table 9.--Fresh Market Broccoli: Estimated Cost of Production, Ontario, 1988

	Cost per hectare	Cost per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 217 hours/ha	1,181	478
Plants, 27,180/ha	544	220
Fertilizer, N - 162 kg/ha; P_2O_5 - 198 kg/ha; K_2O - 198 kg/ha	301	122
Herbicides	12	5
Insecticides	259	104
Tying bands	72	29
Crates, non-returnable, 988/ha	1,384	560
Use of picking bins	479	194
Custom packing and icing	2,076	840
Tractor and machine costs:		
Repairs and maintenance	89	36
Fuel	151	61
Interest on operating capital	183	74
TOTAL VARIABLE COSTS	6,731	2,723
FIXED COSTS		
Operator labour, 32.5 hours/ha	240	97
Management allowance, 5% of gross income	471	190
Tractor and machine costs:		
Depreciation	225	91
Interest on investment	99	40
Insurance and storage	64	26
Interest on land, $4,448/ha @ 5.1% per annum	227	92
Other overhead	62	25
TOTAL FIXED COSTS	1,388	561
TOTAL ALL COSTS	8,119	3,284
COST PER UNIT (Based on average yields of 9.0 tonne/ha and 4.0 ton/ac.)[a]	902.11/tonne	821.00/ton
GROSS MARGIN ANALYSIS (Based on average prices of $1,047.00/tonne and $950.00/ton)[b]		
Gross Income	9,423	3,800
Total variable costs	6,731	2,723
Gross margin	2,692	1,077
CASH ANALYSIS		
Gross income	9,423	3,800
Cash costs[c]	6,841	2,767
Returns over cash costs	2,582	1,033

[a] Five-year average yields for 1983-87.
[b] Industry estimate ($9.50 per carton or $950.00 per ton)
[c] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $48/ha ($19/acre) plus other overhead costs.

Table 10.--Fresh Market Broccoli: Operation Costs, Ontario, 1988

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha	per ac.	per ha	per ac.
		- hours -		- dollars -	
Plowing	1	.99	.40	31.55	12.77
Discing	1	.49	.20	15.47	6.26
Spreading fertilizer	1	.62	.25	13.27	5.37
Spraying herbicide	1	.37	.15	8.25	3.34
Cultivating & levelling .	1	.49	.20	14.68	5.94
Hauling plants & water ..	a	2.47	1.00	54.11	21.90
Planting	1	29.60	12.00	338.62	137.04
Row cultivating	2	2.47	1.00	54.41	22.02
Hand hoeing (labour only)	1	37.10	15.00	194.59	78.75
Spray insecticides	5	1.85	.75	41.32	16.72
Row cultivating and side-dressing fertilizer ...	1	.49	.20	11.98	4.85
Harvesting (labour only).	a	160.62	65.00	883.38	357.50
Harvesting (machine only)	a	--	--	71.46	28.92
Custom packing & icing ..	a	--	--	2,075.68	840.00
Loading and hauling to market[b]	a	12.35	5.00	315.67	127.75

[a] Operation performed as required.
[b] Hauling to market by use of a truck.

Table 11.--Fresh Market Cabbage: Estimated Cost of Production, Ontario, 1988

	Cost per hectare	Cost per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 173 hours/ha	941	381
Plants, 21,000/ha	663	268
Fertilizer, N - 169 kg/ha; P_2O_5 - 225 kg/ha; K_2O - 112 kg/ha	296	120
Herbicide	12	5
Insecticides	168	68
Crates, non-returnable, 1,853/ha	2,422	980
Tractor and machine costs:		
Repairs and maintenance	62	25
Fuel	64	26
Interest on operating capital	128	52
TOTAL VARIABLE COSTS	4,756	1,925
FIXED COSTS		
Operator labour, 21 hours/ha	161	65
Management allowance, 5% of gross income	348	141
Tractor and machine costs:		
Depreciation	133	54
Interest on investment	62	25
Insurance and storage	35	14
Interest on land, $4,448/ha @ 5.1% per annum	227	92
Other overhead	62	25
TOTAL FIXED COSTS	1,028	416
TOTAL ALL COSTS[a]	5,784	2,341
COST PER UNIT (Based on average yields of 35.4 tonne/ha and 15.8 ton/acre)[b]	163.39/tonne	148.16/ton
GROSS MARGIN ANALYSIS (Based on average prices of $196.82/tonne and $178.60/ton)[c]		
Gross income	6,967	2,822
Total variable costs	4,756	1,925
Gross margin	2,211	897
CASH ANALYSIS		
Gross income	6,967	2,822
Cash costs[d]	4,848	1,962
Returns over cash costs	2,119	860

[a] Storage costs not considered.
[b] Five-year average yields for 1983-87.
[c] Two-year average prices 1985-86.
[d] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $30/ha ($12/acre) plus other overhead costs.

Table 12.--Fresh Market Cabbage: Operation Costs, 1988

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha	per ac.	per ha	per ac.
		- hours -		- dollars -	
Plowing	1	.99	.40	31.55	12.77
Discing	1	.49	.20	15.47	6.26
Spreading fertilizer	1	.37	.15	7.17	2.90
Spraying herbicide	1	.37	.15	7.54	3.05
Cultivating & levelling	1	.49	.20	14.58	5.90
Hauling plants & water	[a]	1.23	.50	27.03	10.94
Planting	1	29.60	12.00	319.26	129.20
Spraying insecticides	5	1.85	.75	37.68	15.25
Row cultivating	1	.49	.20	9.93	4.02
Row cultivating and sidedressing	1	.49	.20	11.05	4.47
Hand Hoeing (labour only)	1	17.30	7.00	90.81	36.75
Harvest and pack (labour only)	[a]	136.00	55.00	749.49	302.50
Load and haul to market[b]	[a]	4.94	2.00	137.24	55.54

[a] Operation performed as required.
[b] Hauling to market by use of a truck.

Table 13.--Fresh Market Carrots: Estimated Cost of Production, on Muck Soils, Ontario, 1988

	Cost per hectare	Cost per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 47 hours/ha	252	102
Seed, pelleted, 1,700,000/ha	393	159
Fertilizer, N - 72 kg/ha; P_2O_5 - 28 kg/ha; K_2O - 140 kg/ha	136	56
Herbicides	176	72
Insecticides	112	45
Fungicides	176	71
Tractor and machine costs:		
Repairs and maintenance	235	95
Fuel	121	49
Pallet box repairs	32	13
Storage building repairs and maintenance	51	21
Electricity in storage	64	26
Interest on operating capital	126	51
TOTAL VARIABLE COSTS	1,874	760
FIXED COSTS		
Operator labour, 42 hours/ha	309	125
Management allowance, 5% of gross income	314	127
Tractor and machine costs:		
Depreciation	615	249
Interest on investment	334	135
Insurance and storage	131	53
Pallet box use	710	288
Storage building, interest & depreciation	433	175
Interest on land, $17,297/ha @ 5.1% per annum	882	357
Other overhead	62	25
TOTAL FIXED COSTS	3,790	1,534
TOTAL ALL COSTS[a]	5,664	2,294
COST PER UNIT (Based on average yields of 59.63 tonne/ha and 26.60 ton/acre)[b]	94.98/tonne	86.24/ton
GROSS MARGIN ANALYSIS (Based on average prices of $105.62/tonne and $95.82/ton)[c]		
Gross income	6,298	2,549
Total variable costs	1,874	760
Gross margin	4,424	1,789
CASH ANALYSIS		
Gross income	6,298	2,549
Cash costs[d]	2,100	851
Returns over cash costs	4,198	1,698

[a] Carrots delivered to shipper in bulk bins, no grading and packaging costs are included.
[b] Five-year average yields 1983-87.
[c] Three-year average prices 1983-86.
[d] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $164/ha ($66/acre) plus other overhead costs.

Table 14.--Fresh Market Carrots on Muck Soils: Operation Costs, Ontario, 1988

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha	per ac.	per ha	per ac.
		- hours -		- dollars -	
Fall discing	1	.99	.40	30.91	12.51
Spring discing	1	.99	.40	30.91	12.51
Spreading fertilizer	1	.62	.25	13.27	5.37
Spraying herbicide	2	.99	.40	22.02	8.91
Discing and levelling	1	.99	.40	32.30	13.07
Seeding	1	2.47	1.00	74.53	30.16
Spraying (carrot weevil)	2	.99	.40	22.02	8.91
Spraying (rust fly)	2	.99	.40	26.51	10.73
Spraying herbicide	1	.49	.20	11.00	4.45
Spraying (blight/rust fly)	2	.99	.40	22.02	8.91
Spray control (blight)	6	2.96	1.20	66.12	26.76
Hand weeding	1	9.88	4.00	51.89	21.00
Row cultivating and sidedressing	1	2.47	1.00	60.05	24.30
Hand harvesting	1	4.94	2.00	36.57	14.80
Combining	1	18.54	7.50	534.45	216.29
Hauling and unloading at farm storage	1	24.71	10.00	480.24	194.35
Load for market	[a]	9.88	4.00	84.51	34.20
Haul to market	[a]	2.47	1.00	63.13	25.55

[a] Operation performed as required.

Table 15.--Fresh Market Cauliflower: Estimated Cost of Production, Ontario, 1988

	Cost per hectare	Cost per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 341 hours/ha	1,841	745
Plants, 21,000/ha	441	178
Fertilizer, N - 162 kg/ha; P_2O_5 - 198 kg/ha; K_2O - 198 kg/ha	301	122
Herbicides	11	5
Insectidices	209	84
Tying bands	84	34
Crates, non-returnable, 1,483	2,076	840
Tractor and machine costs:		
Repairs and maintenance	79	32
Fuel	136	55
Interest on operating capital	146	59
TOTAL VARIABLE COSTS	5,324	2,154
FIXED COSTS		
Operator labour, 32.5 hours/ha	240	97
Management allowance, 5% of gross income	480	194
Tractor and machine costs:		
Depreciation	195	79
Interest on investment	86	35
Insurance and storage	59	24
Interest on land, $4,448/ha @ 5.1% per annum	227	91
Other overhead	62	25
TOTAL FIXED COSTS	1,349	545
TOTAL ALL COSTS[a]	6,673	2,699
COST PER UNIT (Based on average yields of 21.5 tonne/ha and 9.6 ton/ac.)[b]	310.37/tonne	281.15/ton
GROSS MARGIN ANALYSIS (Based on average prices of $446.31/tonne and $405.00/ton)[c]		
Gross income	9,596	3,888
Total variable costs	5,324	2,154
Gross margin	4,272	1,734
CASH ANALYSIS		
Gross income	9,596	3,888
Cash costs[d]	5,428	2,196
Returns over cash costs	4,168	1,692

[a] Cauliflower is packed into crates at the farm before being hauled to shipper.
[b] Five-year average yields for 1983-87.
[c] Two-year average prices 1985-86.
[d] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $42/ha ($17/acre) plus other overhead costs.

Table 16.--Fresh Market Cauliflower: Operation Costs, Ontario, 1988

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha	per ac.	per ha	per ac.
		- hours -		- dollars -	
Plowing	1	.99	.40	31.55	12.77
Discing	1	.49	.20	15.47	6.26
Spreading fertilizer	1	.62	.25	13.27	5.37
Spraying herbicide	1	.37	.15	8.25	3.34
Cultivating & levelling	1	.49	.20	14.68	5.94
Hauling plants & water	[a]	2.47	1.00	54.12	21.90
Planting	1	29.60	12.00	338.63	137.04
Row cultivating	2	2.47	1.00	54.41	22.02
Hand hoeing (labour only).	1	37.10	15.00	194.60	78.75
Spray insecticides	5	1.85	.75	41.32	16.72
Row cultivating and side-dressing fertilizer	1	.49	.20	11.98	4.85
Tying heads	1	86.50	35.00	454.05	183.75
Harvesting (labour only) .	[a]	185.00	75.00	1,121.98	454.05
Loading and hauling to market[b]	[a]	24.70	10.00	383.63	155.25

[a] Operation performed as required.
[b] Hauling to market by use of a truck.

Table 17.--Fresh Market Celery (Hand Harvest): Estimated Cost of Production on Muck Soils, Ontario, 1988

	Cost per hectare	Cost per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 867 hours/ha	4,554	1,843
Seedlings, 74,000/ha	445	180
Fertilizer, N - 229 kg/ha; P_2O_5 - 111 kg/ha; K_2O - 334 kg/ha	654	265
Herbicide	99	40
Insecticides	205	83
Fungicides	167	68
Crates, non-returnable, 2,470	3,336	1,350
Tractor and machine costs:		
Repairs and maintenance	116	47
Fuel	220	89
Greenhouse repairs	35	14
Interest on operating capital	292	118
TOTAL VARIABLE COSTS	10,123	4,097
FIXED COSTS		
Operator labour, 79 hours/ha	588	238
Management allowance, 5% of gross income	556	225
Tractor and machine costs:		
Depreciation	279	113
Interest on investment	136	55
Insurance and storage	59	24
Greenhouse, depreciation, interest	156	63
Interest on land, $17,297/ha @ 5.1% per annum	882	357
Other overhead	62	25
TOTAL FIXED COSTS	2,718	1,100
TOTAL ALL COSTS[a]	12,841	5,197
COST PER UNIT (Based on average yields of 53.33 tonne/ha and 23.79 ton/acre)[b]	240.78/tonne	218.45/ton
GROSS MARGIN ANALYSIS (Based on average prices of $208.86/tonne and $189.53/ton)[c]		
Gross income	11,138	4,509
Total variable costs	10,123	4,097
Gross margin	1,015	412
CASH ANALYSIS		
Gross income	11,138	4,509
Cash costs[d]	10,252	4,149
Returns over cash costs	886	360

[a] Includes costs of hand harvesting, washing and packing into crates at farm before delivery to shipper.
[b] Five-year average yields 1983-87.
[c] Three-year average prices 1984-86.
[d] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $67/ha ($27/acre) plus other overhead costs.

Table 18.--Fresh Market Celery on Muck Soils: Operation Costs, Ontario, 1988

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha	per ac.	per ha	per ac.
		- hours -		- dollars -	
Fall discing	1	2.47	1.00	77.32	31.29
Spreading fertilizer	1	.74	.30	15.94	6.45
Discing and levelling	1	.99	.40	32.30	13.07
Transplant in greenhouse	1	148.26	60.00	778.38	315.00
Greenhouse operations	1	14.83	6.00	109.71	44.40
Hauling plants	1	12.36	5.00	320.37	129.65
Planting in field by hand	1	172.97	70.00	908.11	367.50
Hand weeding	1	54.36	22.00	271.81	110.00
Sidedressing	2	4.94	2.00	98.89	40.02
Irrigating	3	44.48	18.00	572.65	231.75
Spraying weeds	2	1.48	.60	32.86	13.30
Spraying insecticide and fungicide	6	4.45	1.80	99.16	40.13
Cutting in field	[a]	444.79	180.00	2,335.14	945.00
Washing and field packing	[a]	24.70	10.00	129.73	52.50
Loading for market	[a]	12.36	5.00	91.43	37.00
Hauling to market	[a]	2.47	1.00	63.14	25.55

[a] Operation performed as required.

Table 19.--Head Lettuce: Estimated Cost of Production, on Muck Soils, Ontario, 1988

	Cost per hectare	Cost per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 536 hours/ha	2,814	1,139
Seed, pelleted, 270,000/ha	138	56
Fertilizer, N - 98 kg/ha; P_2O_5 - 98 kg/ha; K_2O - 98 kg/ha	153	62
Insecticides	353	143
Fungicides	86	35
Tractor and machine costs:		
Repairs and maintenance	133	54
Fuel	168	68
Crates, non-returnable, 835	2,785	1,127
Interest on operating capital	185	75
TOTAL VARIABLE COSTS	6,815	2,759
FIXED COSTS		
Operator labour, 48 hours/ha	356	144
Management allowance, 5% of gross income	474	192
Tractor and machine costs:		
Depreciation	294	119
Interest on investment	131	53
Insurance and storage	77	31
Interest on land, $17,297/ha @ 5.1% per annum	882	357
Other overhead	62	25
TOTAL FIXED COSTS	2,276	921
TOTAL ALL COSTS[a]	9,091	3,680
COST PER UNIT (Based on average yields of 3,017 doz./ha and 1,221 doz./acre)[b]	3.01/doz.	3.01/doz.
GROSS MARGIN ANALYSIS (Based on average prices of $3.14/doz.)[c]		
Gross income	9,473	3,834
Total variable costs	6,815	2,759
Gross margin	2,658	1,075
CASH ANALYSIS		
Gross income	9,473	3,834
Cash costs[d]	6,941	2,810
Returns over cash costs	2,532	1,024

[a] Includes costs of harvesting, packing into crates and delivery to shipper.

[b] Five-year average yields for 1983-87.

[c] Three-year average prices 1984-86.

[d] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $64/ha ($26/acre) plus other overhead costs.

Table 20.--Head Lettuce on Muck Soils: Operation Costs, Ontario, 1988

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha	per ac.	per ha	per ac.
		- hours -		- dollars -	
Fall discing	1	.99	.40	30.91	12.51
Spreading fertilizer	1	.74	.30	15.94	6.45
Discing and levelling	1	.99	.40	32.30	13.07
Seeding	1	2.47	1.00	74.53	30.16
Hand thinning	1	123.55	50.00	648.64	262.50
Irrigating	1	29.65	12.00	268.72	108.75
Spraying insecticides	6	4.45	1.80	99.16	40.13
Spraying fungicides	5	3.71	1.50	82.63	33.44
Hand hoeing	1	98.84	40.00	518.91	210.00
Row cultivating and sidedressing	1	2.47	1.00	60.05	24.30
Harvesting and packing ...	[a]	291.58	118.00	1,530.82	619.50
Spreading crates	[a]	12.35	5.00	265.39	107.40
Hauling to market	[a]	12.35	5.00	343.10	138.85

[a] Operation performed as required.

Table 21.--Peppers for Fresh Market: Estimated Cost of Production, Ontario, 1988

	Cost per hectare	Cost per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 180 hours/ha	983	398
Plants, 27,180/ha	571	231
Fertilizer, N - 204 kg/ha; P_2O_5 - 168 kg/ha; K_2O - 168 kg/ha	242	98
Herbicides	15	6
Insecticides	177	72
Fungicides	131	53
Crates, non-returnable, 1,285/ha	1,181	478
Tractor and machine costs:		
Repairs and maintenance	111	45
Fuel	114	46
Interest on operating capital	99	40
TOTAL VARIABLE COSTS	3,624	1,467
FIXED COSTS		
Operator labour, 41.5 hours/ha	306	124
Management allowance, 5% of gross income	277	112
Tractor and machine costs:		
Depreciation	220	89
Interest on investment	99	40
Insurance and storage	57	23
Interest on land, $4,448/ha @ 5.1% per annum	227	92
Other overhead	62	25
TOTAL FIXED COSTS	1,248	505
TOTAL ALL COSTS	4,872	1,972
COST PER UNIT (Based on average yields of 11.9 tonne/ha and 5.3 ton/acre)[a]	409.41/tonne	372.08/ton
GROSS MARGIN ANALYSIS (Based on average prices of $467.24/tonne and $424.00/ton)[b]		
Gross income	5,560	2,247
Total variable costs	3,624	1,467
Gross margin	1,936	780
CASH ANALYSIS		
Gross income	5,560	2,247
Cash costs[c]	3,734	1,511
Returns over cash costs	1,826	736

[a] Five-year average yields for 1983-87.
[b] Two-year average prices 1985-86.
[c] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $48/ha ($19/acre) plus other overhead costs.

Table 22.--Peppers for Fresh Market: Operation Costs, Ontario, 1988

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha	per ac.	per ha	per ac.
		- hours -		- dollars -	
Plowing	1	1.48	.60	47.34	19.16
Discing	1	.99	.40	30.91	12.51
Spreading fertilizer	1	.99	.40	19.05	7.71
Spraying herbicide	1	.99	.40	20.09	8.13
Cultivating and levelling	1	.99	.40	29.08	11.77
Hauling plants and water	[a]	2.96	1.20	66.15	26.77
Planting	1	17.80	7.20	191.55	77.52
Row cultivating	2	2.47	1.00	43.04	17.42
Hand hoeing (labour only).	1	17.30	7.00	90.81	36.75
Row cultivating and sidedressing fertilizer	1	1.48	.60	29.21	11.82
Spraying insecticides	7	6.92	2.80	140.65	56.92
Spraying fungicides	2	1.98	.80	40.18	16.26
Harvesting and packing (labour only)	[a]	128.00	52.00	706.71	286.00
Loading in field	[a]	29.60	12.00	383.20	155.08
Hauling to market (labour only)	[a]	7.41	3.00	54.06	22.20

[a] Operation performed as required.

Table 23.--Fresh Market Potatoes: Estimated Cost of Production, Ontario, 1988

	Cost per hectare	Cost per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 24 hours/ha	133	54
Seed, potato	348	141
Seed, rye	10	4
Seed treatment	49	20
Fertilizer, N - 168 kg/ha; P_2O_5 - 168 kg/ha; K_2O - 168 kg/ha	235	95
Herbicides	158	64
Insecticides	190	77
Fungicides	107	43
Topkill	37	15
Tractor and machine costs:		
Repairs and maintenance	170	69
Fuel	198	80
Marketing fees	40	16
Interest on operating capital	141	57
TOTAL VARIABLE COSTS	1,816	735
FIXED COSTS		
Operator labour, 17 hours/ha	124	50
Management allowance, 5% of gross income	129	52
Tractor and machine costs:		
Depreciation	324	131
Interest on investment	146	59
Insurance and storage	84	34
Interest on land, $3,707/ha @ 5.1% per annum	190	77
Other overhead	37	15
TOTAL FIXED COSTS	1,034	418
TOTAL ALL COSTS[a]	2,850	1,153
COST PER UNIT (Based on average yields[b] of 19.84 tonne/ha and 177 cwt/acre)	143.65/tonne	6.51/cwt.
GROSS MARGIN ANALYSIS (Based on average prices of $130.04/tonne and $5.90/cwt)[c]		
Gross income	2,580	1044
Total variable costs	1,816	735
Gross margin	764	309
CASH ANALYSIS		
Gross income	2,580	1044
Cash costs[d]	1,925	779
Returns over cash costs	655	265

[a] Does not include storage and marketing costs.
[b] Based on three-year's average yield, 1983-85.
[c] Price estimated based on three year's average return, 1984-86.
[d] Cash costs include variable costs, plus interest on debt portion of investment in tractors and machines of $72/ha ($29/acre) plus other overhead costs.

Table 24.--Fresh Market Potatoes: Operation Costs, Ontario, 1988

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha	per ac.	per ha	per ac.
		- hours -		- dollars -	
Fall plowing	1	.82	.33	29.26	11.84
Discing	2	.74	.30	28.94	11.71
Plant rye	1	.99	.40	38.65	15.64
Spring plowing	1	.99	.40	35.48	14.36
Discing	1	.37	.15	14.46	5.85
Field cultivating	1	.37	.15	13.10	5.30
Cutting seed	1	.86	.35	22.76	9.21
Hauling fertilizer	1	.62	.25	34.77	14.07
Hauling seed	1	1.24	.50	63.78	25.81
Planting	1	4.34	1.75	101.36	41.02
Row cultivating	1	1.36	.55	33.93	13.73
Hilling	1	.82	.33	19.03	7.70
Spraying herbicide	1	.40	.16	12.50	5.06
Spraying insecticide and fungicide	6	1.63	.66	59.45	24.06
Spraying topkill	1	.27	.11	9.88	4.00
Digging and windrowing	1	2.47	1.00	73.88	29.90
Harvesting with combine	1	7.41	3.00	131.55	53.24
Hauling to storage	1	7.41	3.00	383.62	155.25
Unloading and grading	1	7.41	3.00	71.51	28.94

Table 25.--Sweet Corn for Fresh Market (Hand Harvest): Estimated Cost of Production, Ontario, 1988

	Cost per hectare	Cost per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 95 hours/ha	524	212
Seed, 13.5 kg/ha	131	53
Fertilizer, N - 126 kg/ha; P_2O_5 - 64 kg/ha; K_2O - 74 kg/ha	137	55
Herbicide	52	21
Insecticide	116	47
Crates, non-returnable, 445/ha	358	145
Tractor and machine costs:		
Repairs and maintenance	64	26
Fuel	72	29
Custom work	12	5
Interest on operating capital	42	17
TOTAL VARIABLE COSTS	1,508	610
FIXED COSTS		
Operator labour, 25 hours/ha	99	40
Management allowance, 5% of gross income	126	51
Tractor and machine costs:		
Depreciation	141	57
Interest on investment	64	26
Insurance and storage	32	13
Interest on land, $4,448/ha @ 5.1% per annum	227	92
Other overhead	62	25
TOTAL FIXED COSTS	751	304
TOTAL ALL COSTS[a]	2,259	914
COST PER UNIT (Based on average yields of 2,011 doz./ha and 814 doz./acre)[b]	1.12/doz	1.12/doz
GROSS MARGIN ANALYSIS (Based on average prices of $1.25/doz.)[c]		
Gross income	2,514	1,018
Total variable costs	1,508	610
Gross margin	1,006	408
CASH ANALYSIS		
Gross income	2,514	1,018
Cash costs[d]	1,601	648
Returns over cash costs	913	370

[a] Sweet corn is hand harvested and packed into crates at the farm before being hauled to shipper.
[b] Five-year average yields 1983-87.
[c] Two-year average prices 1985-86.
[d] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $31/ha ($13/acre) plus other overhead costs.

Table 26.--Sweet Corn for Fresh Market (Hand Harvest): Operation Costs, Ontario, 1988

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha	per ac.	per ha	per ac.
		- hours -		- dollars -	
Plowing	1	.79	.32	25.25	10.22
Discing	1	.99	.40	30.91	12.51
Spreading fertilizer	1	.99	.40	19.05	7.71
Spraying herbicide	1	.99	.40	20.09	8.13
Cultivating and harrowing	1	.99	.40	29.33	11.87
Hauling seed and fertilizer	a	.30	.12	6.10	2.47
Planting	1	.59	.24	24.64	9.97
Row cultivating	2	1.58	.64	27.55	11.15
Custom applying "N" and herbicide	1	--	--	11.74	4.75
Spray insecticides	4	3.95	1.60	80.38	32.53
Picking and hauling to farm yard	a	69.20	28.00	499.26	202.05
Sort and pack (labour only)	a	24.70	10.00	135.90	55.00
Haul to market[b]	a	2.47	1.00	68.62	27.77
Disc down stalks	1	.99	.40	29.63	11.99

[a] Operation performed as required.
[b] Using a truck.
-- not applicable

Table 27.--Field Tomatoes for Fresh Market:
Estimated Cost of Production, Ontario, 1988

	Cost per hectare	Cost per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 417 hours/ha	2,286	925
Plants, 24,710/ha	650	263
Fertilizer: Plant Starter 6-24-24, 49 litres/ha N - 225 kg/ha; P_2O_5 - 93 kg/ha; K_2O - 270 kg/ha	282	114
Herbicide	12	5
Insecticide	32	13
Fungicide	166	67
Containers, non-returnable, 2,224/ha	3,736	1,512
Use of picking baskets	49	20
Tractor and machine costs:		
Repairs and maintenance	166	67
Fuel	213	86
Interest on operating capital	213	86
TOTAL VARIABLE COSTS	7,817	3,163
FIXED COSTS		
Operator labour, 39 hours/ha	282	114
Management allowance, 5% of gross income	514	208
Tractor and machine costs:		
Depreciation	371	150
Interest on investment	158	64
Insurance and storage	94	38
Interest on land, $4,448/ha @ 5.1% per annum	227	92
Other overhead	62	25
TOTAL FIXED COSTS	1,708	691
TOTAL ALL COSTS[a]	9,525	3,854
COST PER UNIT (Based on average yields of 22.76 tonne/ha and 10.15 ton/acre)[b]	418.50/tonne	379.70/ton
GROSS MARGIN ANALYSIS (Based on average prices of $450.72/tonne and $409.00/ton)[c]		
Gross income	10,258	4,151
Total variable costs	7,817	3,163
Gross margin	2,441	988
CASH ANALYSIS		
Gross income	10,258	4,151
Cash costs[d]	7,957	3,220
Returns over cash costs	2,301	931

[a] Tomatoes are graded and packed into containers at farm before being shipped to dealer.
[b] Five-year average yields for 1983-87.
[c] Two-year average prices 1985-86.
[d] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $78/ha ($32/acre) plus other overhead costs.

Table 28.--Field Tomatoes for Fresh Market:
Operation Costs, Ontario, 1988

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha	per ac.	per ha	per ac.
		- hours -		- dollars -	
Plowing	1	1.48	.60	47.35	19.16
Discing	1	.99	.40	30.02	12.51
Spreading fertilizer	1	.99	.40	19.05	7.71
Spraying herbicide	1	.99	.40	20.09	8.13
Field cultivating and levelling	1	.99	.40	29.08	11.77
Hauling plants & water	[a]	1.98	.80	43.32	17.53
Planting	1	17.80	7.20	191.56	77.52
Row cultivating	1	.90	.40	17.22	6.97
Hand hoeing (labour only).	1	24.70	10.00	129.73	52.50
Row cultivate and sidedress	3	2.96	1.20	58.42	23.64
Spraying for insect and disease control	6	5.93	2.40	120.56	48.79
Harvesting and packing	[a]	380.00	154.00	2,449.18	991.15
Hauling to market[b]	[a]	14.80	6.00	411.72	166.62

[a] Operation performed as required.
[b] Using a truck.

Table 29.--Yellow Seed Onions: Estimated Cost of Production, on Muck Soils, Ontario, 1988

	Cost per hectare	Cost per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 86.5 hours/ha	457	185
Seed, pelleted, treated, 1,110,000/ha	791	320
Fertilizer, N - 147 kg/ha; P_2O_5 - 49 kg/ha; K_2O - 247 kg/ha	284	115
Herbicides	813	329
Insecticides	261	106
Fungicides	277	112
Sprout inhibitor	114	46
Plastic covers	25	10
Tractor and machine costs:		
Repairs and maintenance	217	88
Fuel	131	53
Pallet box repairs	22	9
Storage building and repairs	40	16
Electricity, used in storage	40	16
Interest on operating capital	205	83
TOTAL VARIABLE COSTS	3,677	1,488
FIXED COSTS		
Operator labour, 36 hours/ha	264	107
Management allowance, 5% of gross income	306	124
Tractor and machine costs:		
Depreciation	445	180
Interest on investment	217	88
Insurance and storage	131	53
Pallet box use	499	202
Storage building, interest and depreciation	445	180
Interest on land, $17,297/ha @ 5.1% per annum	882	357
Other overhead	62	25
TOTAL FIXED COSTS	3,251	1,316
TOTAL ALL COSTS[a]	6,928	2,804
COST PER UNIT	157.45/tonne	143.06/ton
(Based on average yields of 44.0 tonne/ha and 19.6 ton/acre)[b]		
GROSS MARGIN ANALYSIS		
(Based on average prices of $138.68/tonne and $125.84/ton)[c]		
Gross income	6,102	2,466
Total variable costs	3,677	1,488
Gross margin	2,425	978
CASH ANALYSIS		
Gross income	6,102	2,466
Cash costs[d]	3,846	1,556
Returns over cash costs	2,256	910

[a] Onions are delivered to shipper in bulk bins, costs of grading and bagging are not included.
[b] Five-year average yields for 1983-87.
[c] Three-year average prices 1984-86.
[d] Include total variable costs, interest on debt portion of investment in tractors and machines of $107/ha ($43/acre) plus other overhead costs.

Table 30.--Yellow Seed Onions on Muck Soils: Operation Costs, Ontario, 1988

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha	per ac.	per ha	per ac.
		- hours -		- dollars -	
Fall discing	1	.99	.40	30.91	12.51
Spreading fertilizer	1	.62	.25	13.27	5.37
Spraying herbicide	1	.49	.20	11.00	4.45
Discing and levelling, spring	1	.99	.40	32.30	13.07
Seeding (onion maggot control)	1	2.47	1.00	74.53	30.16
Spraying herbicide, post emerge	10	4.94	2.00	110.16	44.58
Spraying insecticide	5	2.47	1.00	55.08	22.29
Spraying fungicide	9	4.44	1.80	99.16	40.13
Spraying sprout inhibitor	1	.49	.20	11.00	4.45
Hand weeding	1	42.00	17.00	220.54	89.25
Row cultivating and sidedressing	1	2.47	1.00	60.05	24.30
Pulling and windrowing	1.5	7.41	3.00	168.05	68.01
Combining	1	19.77	8.00	269.80	109.18
Stacking pallet boxes in field	[a]	4.94	2.00	82.68	33.46
Hauling to storage	[a]	4.94	2.00	275.57	111.56
Unloading at storage	[a]	4.94	2.00	25.95	10.50
Load and haul to market	[a]	12.35	5.00	126.39	51.15

[a] Operation performed as required.

Table 31.--Cabbage for Processing: Estimated Cost of Production, Ontario, 1988

	Cost per hectare	Cost per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 37 hours/ha	195	79
Plants, 29,450/ha	250	101
Fertilizer, N - 169 kg/ha; P_2O_5 - 225 kg/ha; K_2O - 112 kg/ha	296	120
Herbicide	12	5
Insecticides	153	62
Tractor and machine costs:		
Repairs and maintenance	74	30
Fuel	94	38
Custom harvest and haul	477	193
Crop insurance	101	41
Marketing fees	25	10
Interest on operating capital	15	6
TOTAL VARIABLE COSTS	1,692	685
FIXED COSTS		
Operator labour, 16.4 hours/ha	121	49
Management allowance, 5% of gross income	111	45
Tractor and machine costs:		
Depreciation	126	51
Interest on investment	59	24
Insurance and storage	25	10
Interest on land, $4,448/ha @ 5.1% per annum	227	92
Other overhead	62	25
TOTAL FIXED COSTS	731	296
TOTAL ALL COSTS	2,423	981
COST PER UNIT (Based on average yields of 38.1 tonne/ha and 17.0 ton/acre)[a]	63.60/tonne	57.70/ton
GROSS MARGIN ANALYSIS (Based on average prices of $58.62/tonne and $53.19/ton)[b]		
Gross income	2,233	904
Total variable costs	1,692	685
Gross margin	541	219
CASH ANALYSIS		
Gross income	2,233	904
Cash costs[c]	1,783	722
Returns over cash costs	450	182

NOTE: Plant cost includes only one-half of plant cost, as processor supplies plants for early crop and the grower for the late crop.

[a] Five-year average yields for 1983-87.

[b] 1988 contract price.

[c] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $29/ha ($12/acre) plus other overhead costs.

Table 32.--Cabbage for Processing: Operation Costs, Ontario, 1988

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha	per ac.	per ha	per ac.
		- hours -		- dollars -	
Plowing	1	.99	.40	41.22	16.68
Discing	1	.37	.15	18.80	7.61
Spreading fertilizer	1	.37	.15	9.46	3.83
Spraying herbicide	1	.37	.15	10.25	4.15
Field cultivating, harrowing and packing	2	.74	.30	33.04	13.37
Hauling plants & water	[a]	1.24	.50	39.12	15.83
Planting	1	29.70	12.00	380.93	154.16
Spraying insecticides	4	1.48	.60	40.99	16.59
Row cultivating	1	.49	.20	13.00	5.26
Hand hoeing (labour only).	1	17.30	7.00	90.81	36.75
Row cultivating and sidedressing fertilizer	1	.49	.20	14.11	5.71
Custom harvest & deliver..	1	--	--	476.66	192.90

[a] Operation performed as required.

Table 33.--Cucumbers for Processing: Estimated Cost of Production, Ontario, 1988

	Cost	
	per hectare	per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 541 hours/ha	2,842	1,150
Seed, 3.36 kg/ha	96	39
Fertilizer, N - 118 kg/ha; P_2O_5 - 168 kg/ha; K_2O - 168 kg/ha	242	98
Insecticide	82	33
Fungicide	128	52
Tractor and machine costs:		
Repairs and maintenance	57	23
Fuel	72	29
Bee rental	57	23
Use of picking baskets	89	36
Crop insurance	74	30
Marketing and grading fees	57	23
Interest on operating capital	35	14
TOTAL VARIABLE COSTS	3,831	1,550
FIXED COSTS		
Operator labour, 5.4 hours/ha	101	41
Management allowance, 5% of gross income	232	94
Tractor and machine costs:		
Depreciation	94	38
Interest on investment	42	17
Insurance and storage	20	8
Interest on land, $4,448/ha @ 5.1% per annum	227	92
Other overhead	62	25
TOTAL FIXED COSTS	778	315
TOTAL ALL COSTS	4,609	1,865
COST PER UNIT (Based on average[a] yields of 20.4 tonne/ha and 9.1 ton/acre)	225.93/tonne	204.95/ton
GROSS MARGIN ANALYSIS (Based on average prices of $228.66/tonne and $207.50/ton)[b]		
Gross income	4,665	1,888
Total variable costs	3,831	1,550
Gross margin	834	338
CASH ANALYSIS		
Gross income	4,665	1,888
Cash costs[c]	3,913	1,583
Returns over cash costs	752	305

[a] Five-year average yields for 1983-87.
[b] 1988 price based on 1987 average price.
[c] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $20/ha ($8/acre) plus other overhead costs.

Table 34.--Cucumbers for Processing: Operation Costs, Ontario, 1988

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha	per ac.	per ha	per ac.
		- hours -		- dollars -	
Plowing	1	.99	.40	41.22	16.68
Discing	1	.37	.15	18.80	7.61
Spreading fertilizer	1	.37	.15	9.46	3.83
Cultivating, harrowing and packing	1	.37	.15	16.53	6.69
Planting	1	.99	.40	34.03	13.77
Hand hoeing (labour only).	1	17.30	7.00	90.81	36.75
Row cultivating	1	.49	.20	13.00	5.26
Spraying fungicides	3	1.11	.45	30.71	12.43
Row cultivating and side-dressing fertilizer	2	1.24	.50	35.26	14.27
Spraying insecticide	1	.37	.15	10.25	4.15
Picking (labour only)	[a]	524.00	212.00	2,750.22	1,113.00
Loading in field	[a]	4.94	2.00	117.27	47.46
Hauling to market [b]	[a]	2.47	1.00	58.64	23.73

[a] Operation performed as required.
[b] Hauling with tractor and wagons.

Table 35.--Green Peas for Processing: Estimated Cost of Production, Ontario, 1988

	Cost per hectare	Cost per acre
	- dollars -	
VARIABLE COSTS		
Seed, 252 kg/ha	250	101
Fertilizer, N - 13 kg/ha; P_2O_5 - 25 kg/ha; K_2O - 38 kg/ha	52	21
Herbicide	37	15
Tractor and machine costs:		
Repairs and maintenance	27	11
Fuel	27	11
Custom harvesting and hauling	358	145
Crop insurance	62	25
Marketing and grading fees	17	7
Interest on operating capital	7	3
TOTAL VARIABLE COSTS	837	339
FIXED COSTS		
Operator labour, 4 hours/ha	30	12
Management allowance, 5% of gross income	77	31
Tractor and machine costs:		
Depreciation	37	15
Interest on investment	20	8
Insurance and storage	7	3
Interest on land, $3,336/ha @ 5.1% per annum	170	69
Other overhead	37	15
TOTAL FIXED COSTS	378	153
TOTAL ALL COSTS	1,215	492
COST PER UNIT (Based on average yields of 4.17 tonne/ha and 1.86 ton/acre)[a]	291.36/tonne	264.52/ton
GROSS MARGIN ANALYSIS (Based on average prices of $368.07/tonne and $334.00/ton)[b]		
Gross income	1,535	621
Total variable costs	837	339
Gross margin	698	282
CASH ANALYSIS		
Gross income	1,535	621
Cash costs[c]	883	358
Returns over cash costs	652	263

[a] Five-year average yields 1983-87.
[b] 1988 price based on the 1987 average price received.
[c] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $9/ha ($4/acre) plus other overhead costs.

Table 36.--Green Peas for Processing: Operation Costs, Ontario, 1988

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha	per ac.	per ha	per ac.
		- hours -		- dollars -	
Plowing	1	.99	.40	41.22	16.68
Discing	1	.35	.14	17.57	7.11
Spreading fertilizer	1	.35	.14	8.82	3.57
Spraying herbicides	2	.69	.28	19.18	7.76
Cultivating, harrowing and packing	1	.35	.14	15.47	6.26
Hauling seed	1	.25	.10	7.81	3.16
Planting	1	.99	.40	37.11	15.02
Custom harvesting and hauling	1	--	--	358.30	145.00

-- not applicable

Table 37.--Green and Wax Beans for Processing: Estimated Cost of Production, Ontario, 1988

	Cost per hectare	Cost per acre
	- dollars -	
VARIABLE COSTS		
Seed, 89 kg/ha	284	115
Fertilizer, N - 17 kg/ha; P_2O_5 - 34 kg/ha; K_2O - 50 kg/ha	52	21
Herbicide	15	6
Tractor and machine costs:		
Repairs and maintenance	25	10
Fuel	25	10
Custom harvesting and hauling	326	132
Custom spraying	15	6
Crop insurance	94	38
Marketing and grading fees	22	9
Interest on operating capital	7	3
TOTAL VARIABLE COSTS	865	350
FIXED COSTS		
Operator labour, 3.6 hours/ha	27	11
Management allowance, 5% of gross income	77	31
Tractor and machine costs:		
Depreciation	36	14
Interest on investment	17	7
Insurance and storage	7	3
Interest on land, $3,336/ha @ 5.1% per annum	170	69
Other overhead	37	15
TOTAL FIXED COSTS	371	150
TOTAL ALL COSTS	1,236	500
COST PER UNIT (Based on average yields of 6.30 tonne/ha and 2.81 ton/acre)[a]	196.19/tonne	177.94/ton
GROSS MARGIN ANALYSIS (Based on average prices of $243.54/tonne and $221.00/ton)[b]		
Gross income	1,534	621
Total variable costs	865	350
Gross margin	669	271
CASH ANALYSIS		
Gross income	1,534	621
Cash costs[c]	910	368
Returns over cash costs	624	253

[a] Five-year average yields for 1983-87.
[b] 1988 contract price.
[c] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $8/ha ($3/acre) plus other overhead costs.

Table 38.--Green and Wax Beans for Processing: Operation Costs, Ontario, 1988

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha	per ac.	per ha	per ac.
		- hours -		- dollars -	
Plowing	1	.99	.40	41.22	16.68
Discing	1	.35	.14	17.57	7.11
Spreading fertilizer	1	.35	.14	8.82	3.57
Spraying herbicide	1	.35	.14	9.59	3.88
Cultivating, harrowing and packing	1	.35	.14	15.47	6.26
Hauling seed	1	.25	.10	7.81	3.16
Planting	1	.49	.20	23.60	9.55
Custom spray herbicide	1	--	--	14.83	6.00
Row cultivating	1	.44	.18	11.69	4.73
Custom harvesting and hauling	1	--	--	326.18	132.00

-- not applicable

Table 39.--Lima Beans for Processing: Estimated Cost of Production, Ontario, 1988

	Cost per hectare	Cost per acre
	- dollars -	
VARIABLE COSTS		
Seed, 59 kg/ha	91	37
Fertilizer, N - 17 kg/ha; P_2O_5 - 34 kg/ha; K_2O - 50 kg/ha	52	21
Herbicide	64	26
Tractor and machine costs:		
Repairs and maintenance	30	12
Fuel	32	13
Custom harvesting and hauling	239	97
Crop insurance	94	38
Marketing fees	15	6
Interest on operating capital	5	2
TOTAL VARIABLE COSTS	622	252
FIXED COSTS		
Operator labour, 4.7 hours/ha	35	14
Management allowance, 5% of gross income	69	28
Tractor and machine costs:		
Depreciation	44	18
Interest on investment	22	9
Insurance and storage	10	4
Interest on land, $4,448/ha @ 5.1% per annum	227	92
Other overhead	37	15
TOTAL FIXED COSTS	444	180
TOTAL ALL COSTS	1,066	432
COST PER UNIT (Based on average yields of 2.47 tonne/ha and 1.10 ton/acre)[a]	431.58/tonne	392.73/ton
GROSS MARGIN ANALYSIS (Based on average prices of $552.10/tonne and $501.00/ton)[b]		
Gross income	1,364	551
Total variable costs	622	252
Gross margin	742	299
CASH ANALYSIS		
Gross income	1,364	551
Cash costs[c]	670	272
Returns over cash costs	694	279

[a] Five-year average yields for 1983-87.
[b] 1988 contract price.
[c] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $11/ha ($5/acre) plus other overhead costs.

Table 40.--Lima Beans: Operation Costs, Ontario, 1988

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha	per ac.	per ha	per ac.
		- hours -		- dollars -	
Plowing	1	.99	.40	41.22	16.68
Discing	1	.34	.14	17.57	7.11
Spreading fertilizer	1	.34	.14	8.82	3.57
Spraying herbicide	1	.34	.14	9.59	3.88
Cultivating, harrowing and packing	2	.69	.28	30.81	12.47
Hauling seed	1	.25	.10	7.81	3.16
Planting	1	.49	.20	23.60	9.55
Spraying herbicide	1	.34	.14	9.59	3.88
Rotary hoeing	1	.34	.14	9.49	3.84
Row cultivating	1	.54	.22	14.28	5.78
Custom swathing	1	--	--	21.00	8.50
Custom harvesting and hauling	1	--	--	217.45	88.00

-- not applicable

Table 41.--Peppers for Processing: Estimated Cost of Production, Ontario, 1988

	Cost per hectare	Cost per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 178 hours/ha	934	378
Plants, 27,180/ha	531	215
Fertilizer, N - 118 kg/ha; P_2O_5 - 168 kg/ha; K_2O - 168 kg/ha	242	98
Herbicide	15	6
Insecticides	177	72
Allowance for use of picking baskets	69	28
Tractor and machine costs:		
Repairs and maintenance	106	43
Fuel	146	59
Crop insurance	138	56
Marketing fees	47	19
Interest on operating capital	44	18
TOTAL VARIABLE COSTS	2,449	992
FIXED COSTS		
Operator labour, 27.8 hours/ha	205	83
Management allowance, 5% of gross income	208	84
Tractor and machine costs:		
Depreciation	190	77
Interest on investment	86	35
Insurance and storage	37	15
Interest on land, $4,448/ha @ 5.1% per annum	227	92
Other overhead	62	25
TOTAL FIXED COSTS	1,015	411
TOTAL ALL COSTS	3,464	1,403
COST PER UNIT (Based on average yields of 14.80 tonne/ha and 6.60 ton/acre)[a]	234.05/tonne	212.58/ton
GROSS MARGIN ANALYSIS (Based on average prices of $279.79/tonne and $253.90/ton)[b]		
Gross income	4,141	1,676
Total variable costs	2,449	992
Gross margin	1,692	684
CASH ANALYSIS		
Gross income	4,141	1,676
Cash costs[c]	2,553	1,034
Returns over cash costs	1,588	642

[a] Five-year average yields for 1983-87.
[b] Price based on 1987 average price.
[c] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $42/ha ($17/acre) plus other overhead costs.

Table 42.--Peppers for Processing: Operation Costs, Ontario, 1988

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha	per ac.	per ha	per ac.
		- hours -		- dollars -	
Plowing	1	.99	.40	41.22	16.68
Discing	1	.37	.15	18.80	7.61
Spreading fertilizer	1	.37	.15	9.46	3.83
Spraying herbicide	1	.37	.15	10.25	4.15
Cultivating, harrowing and packing	2	.74	.30	33.04	13.37
Hauling plants	[a]	1.24	.50	39.12	15.83
Planting	1	29.60	12.00	380.93	154.16
Row cultivating	1	.62	.25	16.23	6.57
Spraying insecticides	7	2.59	1.05	71.71	29.02
Hand hoeing (labour only).	1	17.30	7.00	90.81	36.75
Row cultivating and sidedressing	1	.74	.30	21.15	8.56
Hand picking (labour only)	[a]	133.43	54.00	700.54	283.50
Loading in field	[a]	14.83	6.00	214.83	86.94
Hauling to market[b]	[a]	2.47	1.00	58.64	23.73

[a] Operation performed as required.
[b] Hauling to market by using a tractor and wagons.

Table 43.--Potatoes for Processing: Estimated Cost of Production, Ontario, 1988

	Cost per hectare	Cost per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 30.0 hours/ha	163	66
Cover crop seed	37	15
Potato seed	465	188
Seed treatment	49	20
Fertilizer, N - 185 kg/ha; P_2O_5 - 185 kg/ha; K_2O - 185 kg/ha	262	106
Herbicide	111	45
Insecticides	210	85
Fungicides	101	41
Topkill	37	15
Tractor and machine costs:		
Repairs and maintenance	203	82
Fuel	250	101
Custom work	44	18
Marketing fees	57	23
Interest on operating capital	166	67
TOTAL VARIABLE COSTS	2,155	872
FIXED COSTS		
Operator labour, 16.2 hours/ha	123	50
Management allowance, 5% of gross income	154	62
Tractor and machine costs:		
Depreciation	390	158
Interest on investment	175	71
Insurance and storage	99	40
Interest on land, $3,707/ha @ 5.1% per annum	190	77
Other overhead	37	15
TOTAL FIXED COSTS	1,168	473
TOTAL ALL COSTS[a]	3,323	1,345
COST PER UNIT	156.01/tonne	7.08/cwt.
(Based on average yields of 21.3 tonne/ha and 190 cwt./acre)[b]		
GROSS MARGIN ANALYSIS		
(Based on average prices of $144.62/tonne and $6.56/cwt)[c]		
Gross income	3,080	1,246
Total variable costs	2,155	872
Gross margin	925	374
CASH ANALYSIS		
Gross income	3,080	1,246
Cash costs[d]	2,277	921
Returns over cash costs	803	325

[a] This does not include storage costs.
[b] Three year's average yields for 1983-85.
[c] Price estimated based on three year's average return, 1984-86.
[d] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $85/ha ($34/acre) plus other overhead costs.

Table 44.--Potatoes for Processing: Operation Costs, Ontario, 1988

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha	per ac.	per ha	per ac.
		- hours -		- dollars -	
Discing	1	1.24	.50	48.21	19.51
Seeding cover crop	1	.62	.25	24.17	9.78
Spring plowing (cover crops)	1	1.24	.50	44.35	17.95
Spreading lime (custom)	1	--	--	43.24	17.50
Chisel plowing	1	1.24	.50	40.06	16.21
Discing	1	1.24	.50	48.21	19.51
Field cultivating	2	.27	.33	28.84	11.67
Cutting seed	1	.86	.35	22.76	9.21
Hauling fertilizer and seed	1	2.47	1.00	129.26	52.31
Planting	1	1.78	.72	63.13	25.55
Row cultivating	1	.69	.28	17.30	7.00
Hilling	1	1.24	.50	29.63	11.99
Hauling water for spraying	1	1.24	.50	66.67	26.98
Spraying herbicide	1	.49	.20	15.64	6.33
Spraying insecticide	1	.32	.13	11.69	4.73
Spraying fungicide	5	1.73	.70	63.08	25.53
Spraying topkill	1	.32	.13	11.69	4.73
Digging and windrowing	1	2.47	1.00	91.16	36.89
Harvesting with combine	1	7.41	4.00	139.22	56.34
Hauling to storage	1	7.41	3.00	381.53	154.40
Unload at storage	1	7.41	4.00	84.48	34.19

Table 45.--Red Beets for Processing: Estimated Cost of Production, Ontario, 1988

	Cost per hectare	Cost per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 62 hours/ha	324	131
Seed, 7 kg/ha	64	26
Fertilizer, N - 123 kg/ha; P_2O_5 - 142 kg/ha; K_2O - 101 kg/ha	207	84
Herbicide	306	124
Micronutrient Sprays	19	8
Tractor and machine costs:		
Repairs and maintenance	52	21
Fuel	57	23
Custom harvesting and hauling	534	216
Crop insurance	37	15
Marketing fees	30	12
Interest on operating capital	44	18
TOTAL VARIABLE COSTS	1,674	678
FIXED COSTS		
Operator labour, 13 hours/ha	96	39
Management allowance, 5% of gross income	131	53
Tractor and machine costs:		
Depreciation	82	33
Interest on investment	40	16
Insurance and storage	17	7
Interest on land, $6,672/ha @ 5.1% per annum	340	138
Other overhead	37	15
TOTAL FIXED COSTS	743	301
TOTAL ALL COSTS	2,417	979
COST PER UNIT (Based on average yields of 30.81 tonne/ha and 13.74 ton/acre)[a]	78.45/tonne	71.25/ton
GROSS MARGIN ANALYSIS (Based on average prices of $85.74/tonne and $77.80/ton)[b]		
Gross income	2,642	1,069
Total variable costs	1,674	678
Gross margin	968	391
CASH ANALYSIS		
Gross income	2,642	1,069
Cash costs[c]	1,730	701
Returns over cash costs	912	368

[a] Five-year average yields for 1983-87.
[b] 1988 price based on 1987 average price.
[c] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $19/ha ($8/acre) plus other overhead costs.

Table 46.--Red Beets for Processing: Operation Costs, Ontario, 1988

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha	per ac.	per ha	per ac.
		- hours -		- dollars -	
Plowing	1	.79	.32	32.99	13.35
Discing	1	.40	.16	20.04	8.11
Spreading fertilizer	1	.40	.16	10.08	4.08
Spraying herbicide	2	.79	.32	21.84	8.84
Cultivating and harrowing	1	.40	.16	16.31	6.60
Planting	1	1.98	.80	68.10	27.56
Row cultivating	3	3.56	1.44	93.60	37.88
Hand hoeing (labour only)	1	61.80	25.00	324.32	131.25
Spraying foliar micronutrients	2	.79	.32	21.87	8.85
Custom harvesting	1	--	--	266.63	107.90
Custom hauling	1	--	--	266.63	107.90
Helping harvest (labour only)	[a]	2.47	1.00	18.29	7.40

-- not applicable
[a] Operation performed as required.

Table 47.--Sweet Corn for Processing: Estimated Cost of Production, Ontario, 1988

	Cost per hectare	Cost per acre
	- dollars -	
VARIABLE COSTS		
Seed, 9 kg/ha	51	21
Fertilizer, N -111 kg/ha; P_2O_5 - 68 kg/ha; K_2O - 68 kg/ha	131	53
Herbicide	53	21
Insecticide	14	6
Tractor and machine costs:		
Repairs and maintenance	27	11
Fuel	30	12
Custom spray and apply "N"	27	11
Custom harvest and haul	158	64
Crop insurance	32	13
Marketing fees	10	4
Interest on operating capital	5	2
TOTAL VARIABLE COSTS	538	218
FIXED COSTS		
Operator labour, 3.9 hours/ha	30	12
Management allowance, 5% of gross income	49	20
Tractor and machine costs:		
Depreciation	40	16
Interest on investment	20	8
Insurance and storage	7	3
Interest on land, $3,336/ha @ 5.1% per annum	170	69
Other overhead	37	15
TOTAL FIXED COSTS	353	143
TOTAL ALL COSTS	891	361
COST PER UNIT (Based on average yields of 11.62 tonne/ha and 5.18 ton/acre)[a]	76.68/tonne	69.69/ton
GROSS MARGIN ANALYSIS (Based on average prices of $84.96/tonne and $77.10/ton)[b]		
Gross income	987	399
Total variable costs	538	218
Gross margin	449	181
CASH ANALYSIS		
Gross income	987	399
Cash costs[c]	585	237
Returns over cash costs	402	162

[a] Five-year average yields for 1983-87.
[b] 1988 contract price used at 70% domestic and 30% export.
[c] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $10/ha ($4/acre) plus other overhead costs.

Table 48.--Sweet Corn for Processing: Operation Costs, Ontario, 1988

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha	per ac.	per ha	per ac.
		- hours -		- dollars -	
Plowing	1	.99	.40	41.22	16.68
Discing	1	.34	.14	17.57	7.11
Spreading fertilizer	1	.34	.14	8.82	3.57
Cultivating, harrowing and packing	1	.34	.14	15.47	6.26
Hauling seed	1	.25	.10	7.81	3.16
Planting	1	.49	.20	23.60	9.55
Spraying herbicide	1	.34	.14	9.59	3.88
Row cultivating	1	.44	.18	11.69	4.73
Custom apply "N" and herbicide	1	--	--	13.59	5.50
Custom spray insecticide	1	--	--	13.59	5.50
Custom harvest and haul	1	--	--	157.90	63.90
Discing stalks	1	.34	.14	17.57	7.11

-- not applicable

Table 49.--Tomatoes for Processing, Hand Harvest, Estimated Cost of Production, Ontario, 1988

	Cost per hectare	Cost per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 334 hours/ha	1,875	759
Plants, 22,485/ha	435	177
Fertilizer: plant starter, 25 litres/hectare	12	5
N - 113 kg/ha; P_2O_5 - 94 kg/ha; K_2O - 269 kg/ha	220	89
Herbicide	62	25
Insecticides and fungicides (custom applied, materials included)	374	151
Basket use for picking, 247/ha	138	56
Other materials	22	9
Tractor and machine costs:		
Repairs and maintenance	89	36
Fuel	126	51
Custom hauling	369	149
Crop insurance	85	34
Marketing board and grading fees	84	34
Interest on operating capital	74	30
TOTAL VARIABLE COSTS	3,965	1,605
FIXED COSTS		
Operator labour, 18 hours/ha	136	55
Management allowance, 5% of gross income	262	106
Tractor and machine costs:		
Depreciation	156	63
Interest on investment	72	29
Insurance and storage	32	13
Land rental charges	432	175
Other overhead	37	15
TOTAL FIXED COSTS	1,127	456
TOTAL ALL COSTS	5,092	2,061
COST PER UNIT (Based on average yields of 41.80 tonne/ha and 18.64 ton/acre)[a]	121.82/tonne	110.57/ton
GROSS MARGIN ANALYSIS (Based on average prices of $125.55/tonne and $113.93/ton)[b]		
Gross income	5,248	2,124
Total variable costs	3,965	1,605
Gross margin	1,283	519
CASH ANALYSIS		
Gross income	5,248	2,124
Cash costs[c]	4,037	1,634
Returns over cash costs	1,211	490

[a] Five-year average yields for 1983-87.

[b] Using option A, agtron reading of 26, average cull tare of 3% and the 1988 price schedule.

[c] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $35/ha ($14/acre) plus other overhead costs.

Table 50.--Tomatoes for Processing, Hand Harvest: Operation Costs, Ontario, 1988

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha	per ac.	per ha	per ac.
		- hours -		- dollars -	
Plowing	1	.74	.30	30.91	12.51
Discing	1	.37	.15	18.80	7.61
Spreading fertilizer	1	.37	.15	9.46	3.83
Field cultivating and harrowing	1	.37	.15	15.32	6.20
Spraying herbicide	1	.37	.15	10.25	4.15
Incorporate Spray	1	.37	.15	15.07	6.10
Hauling water and plants	a	1.73	.70	48.06	19.45
Planting	1	27.18	11.00	248.65	100.63
Row cultivating	2	.99	.40	22.41	9.07
Row cultivating and sidedressing	1	.62	.25	15.42	6.24
Hand hoeing (labour only)	1	17.30	7.00	90.81	36.75
Apply ethrel	b	.25	.10	6.82	2.76
Hand picking (labour only)	a	273.55	110.70	1,527.35	618.11
Spreading baskets	a	5.93	2.40	70.01	28.33
Loading in field	a	22.24	9.00	355.75	143.97
Hauling to processor (custom)	a	--	--	368.68	149.20

[a] Operation performed as required.
[b] Applied on 20% of the acreage.

Table 51.--Tomatoes for Processing, Machine Harvest: Estimated Cost of Production, Ontario, 1988

	Cost per hectare	Cost per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 73.4 hours/ha	413	167
Plants, 33,360 kg/ha	650	263
Fertilizer: plant starter, 20 litres/ha	12	5
N - 90 kg/ha; P_2O_5 - 94 kg/ha; K_2O - 269 kg/ha	207	84
Herbicide	62	25
Insecticides and fungicides	195	79
Other materials	79	32
Tractor and machine costs:		
Repairs and maintenance	282	114
Fuel	185	75
Crop insurance	91	37
Marketing board and grading fees	84	34
Interest on operating capital	59	24
TOTAL VARIABLE COSTS	2,319	939
FIXED COSTS		
Operator labour, 34 hours/ha	143	58
Management allowance, 5% of gross income	257	104
Tractor and machine costs:		
Depreciation	1,112	450
Interest on investment	385	156
Insurance and storage	124	50
Land rental charges	556	225
Other overhead	37	15
TOTAL FIXED COSTS	2,614	1,058
TOTAL ALL COSTS	4,933	1,997
COST PER UNIT (Based on average yields of 41.80 tonne/ha and 18.64 ton/acre)[a]	118.01/tonne	107.14/ton
GROSS MARGIN ANALYSIS (Based on average prices of $123.01/tonne and $111.62/ton)[b]		
Gross income	5,142	2,081
Total variable costs	2,319	939
Gross margin	2,823	1,142
CASH ANALYSIS		
Gross income	5,142	2,081
Cash costs[c]	2,545	1,030
Returns over cash costs	2,597	1,051

[a] Five-year average yields for 1983-87.
[b] Using option B, agtron reading of 28, average cull tare of 4% and the 1988 price schedule.
[c] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $189/ha ($76/acre) plus other overhead costs.

Table 52.--Tomatoes for Processing, Machine Harvest: Operation Costs, Ontario, 1988

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha	per ac	per ha	per ac
		- hours -		- dollars -	
Plowing	1	.62	.25	25.75	10.42
Spreading fertilizer	1	.49	.20	11.93	4.83
Shape beds (fall)	1	.62	.25	35.14	14.22
Reshape beds (spring)	1	.62	.25	35.14	14.22
Incorporate herbicide (using shaper)	1	.62	.25	35.14	14.22
Haul water and plants	a	.84	.34	17.42	7.05
Planting	1	27.08	10.96	218.90	88.59
Control weeds (using shaper)	2	.99	.40	56.22	22.75
Control weeds and sidedress (using shaper)	2	1.24	.50	70.28	28.44
Hand hoe (labour only)	1	17.30	7.00	90.81	36.75
Spray fungicides	6	2.22	.90	97.43	39.43
Spray insecticides	2	.74	.30	32.49	13.15
Haul water for spraying	a	.44	.18	15.02	6.08
Apply ethrel	b	.49	.20	22.31	9.03
Harvesting	1	23.23	9.40	1,229.20	497.45
Hauling from harvester	1	8.30	3.36	267.24	108.15
Delivery to processor	a	6.92	2.80	383.30	155.12

[a] Operation performed as required.
[b] Applied on 75% of the acreage.

Appendix Table 1.-- Average Yields per Acre for Vegetables, Ontario, 1983-1987

Crop	Unit	1983	1984	1985	1986	1987	Avg. 5 Yr.
				- '000 -			
Asparagus (f & p)	lb	1.1	1.1	1.2	1.4	1.2	1.2
Beans, green & wax (f) ..	lb	5.6	5.7	4.9	3.9	3.8	4.8
Beans, green & wax (p) ..	lb	4.9	5.7	5.6	5.1	6.0	5.5
Beans, Lima (p)	lb	2.5	2.7	2.0	1.2	2.0	2.1
Beets, topped	lb	25.5	28.7	28.7	26.0	28.7	27.5
Beets, bunching	lb	10.8	12.9	14.6	6.1	10.7	11.0
Broccoli (f & p)	lb	11.8	9.1	7.6	7.2	7.4	8.6
Brussel Sprouts	lb	9.7	10.1	9.3	4.2	4.3	7.5
Cabbage	lb	34.0	34.5	34.5	25.0	27.8	31.2
Carrots, bunching	lb	10.1	10.2	9.7	8.2	10.9	9.8
Carrots, topped (f & p) .	lb	62.6	65.1	51.7	43.3	49.6	54.5
Cauliflower (f & p)	lb	20.1	21.3	16.3	20.1	18.9	19.3
Celery (f & p)	lb	65.4	70.3	56.0	53.1	64.3	61.8
Corn, sweet (f)	dz	0.8	0.9	0.9	0.8	0.8	0.8
Corn, sweet (p)	lb	9.2	10.6	10.2	10.4	11.4	10.4
Cucumber (f)	lb	17.7	15.7	11.9	10.5	9.5	13.1
Cucumber (p)	lb	18.2	18.3	18.4	19.5	17.4	18.4
Lettuce, head (f)	dz	1.1	1.2	1.3	1.2	1.3	1.2
Onions, dry sets	lb	16.4	18.6	21.2	18.2	20.9	19.1
Onions, dry silverskin ..	lb	10.1	10.1	11.5	7.0	10.3	9.8
Onions, dry Spanish	lb	25.1	23.1	18.4	26.9	25.9	23.9
Onions, dry yellowskin ..	lb	37.1	31.6	43.6	36.1	37.6	37.2
Onions, bunching	lb	13.6	16.2	17.0	13.0	13.4	14.6
Parsnips	lb	17.5	17.6	16.6	17.5	17.3	17.3
Peas, green (p)	lb	2.0	3.4	4.1	3.4	3.2	3.2
Peppers (f & p)	lb	11.1	10.8	10.7	9.5	11.2	10.7
Potatoes	lb	19.8	19.1	20.5	20.4	18.7	19.7
Pumpkin & Squash	lb	24.6	27.0	20.3	27.9	27.1	25.4
Radishes	lb	9.1	9.3	10.1	11.5	10.2	10.0
Rutabagas	lb	24.8	36.0	28.8	32.5	30.4	30.5
Spinach	lb	5.6	8.0	9.0	5.5	8.0	7.2
Tomatoes (f)	lb	20.1	20.2	21.2	27.7	18.9	21.6
Tomatoes (p)	lb	29.6	39.3	39.1	39.1	40.1	37.4

Note: (f) fresh; (f & p) fresh & processing; (p) processing;
n/a not available

Source: Seasonal Fruit and Vegetable Report, Annual Summary, Economics and Policy Coordination Branch, Ontario Ministry of Agriculture and Food.

Appendix Table 2.--Average Prices per Unit for Vegetables, Ontario, 1983-1987

Crop	Unit	1983	1984	1985	1986	1987	Avg. 5 Yr.
				- cents -			
Asparagus (f & p)	1b	102.8	101.0	99.3	96.0	94.4	98.7
Beans, green & wax (f) ..	1b	27.0	28.0	26.9	38.4	34.4	29.9
Beans, green & wax (p) ..	1b	11.0	11.6	11.7	10.9	10.0	11.0
Beans, Lima (p)	1b	23.0	24.3	24.6	24.4	24.0	24.1
Beets, topped	1b	5.0	5.4	3.8	5.8	5.3	5.1
Beets, bunching	1b	43.4	41.0	31.3	33.7	44.3	38.7
Broccoli (f & p)	1b	34.2	34.6	34.7	38.1	34.3	35.2
Brussel Sprouts	1b	48.2	44.3	35.0	41.6	59.2	45.7
Cabbage (f & p)	1b	9.8	5.5	7.3	11.6	11.4	9.1
Carrots, bunching	1b	8.1	3.1	27.2	24.4	29.5	18.5
Carrots, topped (f & p) .	1b	16.7	16.3	4.8	7.0	4.7	9.9
Cauliflower (f & p)	1b	17.8	15.3	20.8	19.8	21.0	18.9
Celery (f & p)	1b	13.6	8.2	10.2	10.4	8.6	10.2
Corn, sweet (f)	dz	120.4	105.0	121.0	128.0	128.2	120.5
Corn, sweet (p)	1b	3.8	3.6	3.6	3.3	3.8	3.6
Cucumber (f)	1b	12.8	11.0	17.5	17.5	21.4	16.0
Cucumber (p)	1b	9.6	10.5	10.4	10.2	9.4	10.0
Cucumber, greenhouse	dz	506.0	630.9	524.5	535.6	763.4	592.1
Lettuce (f).....	dz	347.7	331.0	291.0	321.0	330.4	324.2
Onions, dry sets	1b	11.8	10.9	10.1	15.9	12.4	12.2
Onions, dry, silverskin .	1b	40.3	41.0	42.0	35.1	33.5	38.4
Onions, dry, spanish	1b	14.8	15.2	13.2	14.6	14.4	14.4
Onions, dry, yellowskin .	1b	11.0	4.4	4.0	11.6	11.3	8.5
Onions, bunching	1b	34.1	34.8	39.8	41.7	49.8	40.0
Parsnips	1b	16.0	16.0	16.0	15.2	16.2	15.9
Peas, green (p)	1b	15.0	16.1	17.0	16.5	15.6	16.0
Peppers (f & p)	1b	14.7	15.1	20.5	21.9	18.9	18.2
Potatoes	1b	7.8	6.8	5.3	9.0	6.7	7.1
Pumpkin & Squash	1b	2.0	1.7	1.8	1.8	1.8	1.8
Radishes	1b	26.3	33.7	33.8	26.9	31.5	30.4
Rutabagas	1b	7.1	3.9	5.5	4.9	7.4	5.8
Spinach	1b	29.8	29.0	20.3	31.2	30.1	28.1
Tomatoes (f)	1b	20.1	20.2	19.2	27.0	21.7	21.6
Tomatoes, greenhouse	1b	60.8	80.1	59.2	75.8	82.1	71.6
Tomatoes (p)	1b	5.1	5.6	5.6	5.6	5.2	5.4

Note: (f) fresh; (f & p) fresh & processing; (p) processing;
n/a not available

Source: Seasonal Fruit and Vegetable Report, Annual Summary, Economics and Policy Coordination Branch, Ontario Ministry of Agriculture and Food.

Appendix Table 3.--Average Yields per Hectare for Vegetables, Ontario, 1983-1987

Crop	1983	1984	1985	1987	1987	Avg. 5 Yr.
			- tonnes -			
Asparagus (f & p)	1.2	1.2	1.3	1.6	1.4	1.3
Beans, green & wax (f) ...	6.3	6.4	5.5	4.4	4.3	5.4
Beans, green & wax (p) ...	5.5	6.4	6.3	5.7	6.7	6.1
Beans, lima (p)	2.8	3.0	1.8	1.1	2.3	2.2
Beets, topped	28.6	32.2	32.1	29.1	32.2	30.8
Beets, bunching	11.9	14.5	16.4	6.8	12.0	12.3
Broccoli (f & p)	13.2	10.2	8.5	8.0	8.3	9.6
Brussel Sprouts	10.9	11.3	10.5	4.7	4.8	8.4
Cabbage (f & p)	38.1	38.7	38.7	28.6	31.2	35.1
Carrots, bunching	11.3	11.4	11.0	9.2	12.2	11.0
Carrots, topped (f & p) ..	70.2	73.0	58.1	48.7	55.6	61.1
Cauliflower (f & p)	22.5	23.9	18.3	22.5	21.2	21.7
Celery (f & p)	73.3	78.8	62.8	59.6	72.1	69.3
Corn, sweet (f)	5.5	6.1	5.8	5.1	5.3	5.6
Corn, sweet (p)	10.3	11.9	11.4	11.7	12.8	11.6
Cucumber (f)	19.8	17.6	13.3	11.8	10.6	14.6
Cucumber (p)	20.4	20.5	20.7	21.9	19.5	20.6
Lettuce, (f)	16.5	20.2	22.0	20.2	21.8	20.1
Onions, dry sets	18.4	20.9	23.8	20.4	23.4	21.4
Onions, dry silverskin ...	11.3	11.3	12.8	7.8	11.5	10.9
Onions, dry spanish	28.1	25.9	20.6	30.1	29.0	26.7
Onions, dry yellowskin ...	41.6	35.4	48.9	40.5	42.1	41.7
Onions, bunching	17.9	18.2	19.1	14.6	15.0	17.0
Parsnips	19.6	19.7	18.6	19.6	19.4	19.4
Peas, green (p)	2.2	3.8	4.6	3.8	3.5	3.6
Peppers (f & p)	12.4	12.1	12.5	10.6	12.6	12.0
Potatoes	22.2	21.4	22.9	21.7	21.0	21.8
Pumpkin & Squash	27.6	30.3	22.8	31.3	30.3	28.5
Radishes	10.2	10.4	11.3	12.9	11.5	11.3
Rutabagas	27.8	31.2	32.3	36.5	34.1	32.4
Spinach	6.3	9.0	10.1	6.2	9.0	8.1
Tomatoes (f)	22.5	22.6	23.7	31.0	21.1	24.2
Tomatoes (p)	33.2	44.1	43.8	43.8	44.9	42.0

Note: (f) fresh; (f & p) fresh & processing; (p) processing;
n/a not available

Source: Seasonal Fruit and Vegetable Report, Annual Summary, Economics and Policy Coordination Branch, Ontario Ministry of Agriculture and Food.

Appendix Table 4.--Average Prices per Kilogram for Vegetables, Ontario 1983-1987

Crop	1983	1984	1985	1987	1987	Avg. 5 Yr.
			- cents -			
Asparagus (f & p)	226.7	223.5	219.3	211.9	208.1	217.9
Beans, green & wax (f) ...	59.4	61.7	59.2	84.7	75.8	68.2
Beans, green & wax (p) ...	24.3	25.6	25.8	24.0	22.1	24.4
Beans, lima (p)	50.7	53.6	54.2	53.7	52.9	53.0
Beets, topped	11.0	11.9	8.5	12.8	11.6	11.2
Beets, bunching	95.6	90.4	69.0	74.3	97.6	85.4
Broccoli (f & p)	75.4	76.3	76.6	84.1	75.6	77.6
Brussel Sprouts	106.4	97.7	77.2	91.7	130.5	100.7
Cabbage (f & p)	21.7	12.1	16.2	25.6	25.2	20.2
Carrots, topped (f & p) ..	36.8	35.9	10.5	15.4	10.4	21.8
Carrots, bunching	18.0	6.8	60.0	53.8	65.0	33.6
Cauliflower (f & p)	39.8	33.7	45.9	43.7	46.3	41.9
Celery (f & p)	30.0	18.1	22.4	22.9	19.0	22.5
Corn, sweet (f)	44.6	38.6	44.4	47.1	47.1	44.4
Corn, sweet (p)	8.4	7.9	8.0	7.3	8.4	8.0
Cucumber (f)	28.1	24.3	38.7	38.6	47.2	35.4
Cucumber (p)	21.2	23.2	23.0	22.4	20.7	22.1
Cucumber, greenhouse	139.4	173.9	144.5	147.6	210.4	163.2
Lettuce (f)	51.1	48.7	42.8	47.2	48.6	47.7
Onions, dry sets	25.9	24.0	22.3	35.1	27.3	26.9
Onions, dry silverskin ...	88.7	90.4	92.6	77.4	73.9	84.6
Onions, dry spanish	32.6	33.5	29.1	32.2	31.7	31.8
Onions, dry yellowskin ...	24.2	9.7	8.8	25.6	24.9	18.6
Onions, bunching	75.3	76.7	87.7	91.9	109.7	88.3
Parsnips	35.3	35.3	35.2	33.5	35.8	35.0
Peas, green (p)	33.1	33.3	37.4	36.3	34.4	34.9
Peppers (f & p)	32.4	33.3	45.2	48.3	41.6	40.2
Potatoes	17.2	15.0	11.6	19.8	14.8	15.7
Pumpkin & Squash	4.4	3.8	4.0	4.0	4.1	4.1
Radishes	58.0	74.3	74.5	59.3	69.4	67.1
Rutabagas	15.7	8.6	12.2	10.8	16.4	12.7
Spinach	65.8	63.9	44.6	68.8	66.3	61.9
Tomatoes (f)	45.3	44.5	42.4	59.5	47.9	47.9
Tomatoes, greenhouse	134.0	176.6	130.4	167.1	181.0	157.8
Tomatoes (p)	11.2	12.4	12.4	12.3	11.4	11.9

Note: (f) fresh; (f & p) fresh & processing; (p) processing;
n/a not available

Source: Seasonal Fruit and Vegetable Report, Annual Summary, Economics and Policy Coordination Branch, Ontario Ministry of Agriculture and Food.

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